

Post-stroke seizures in the rat collagenase model

Charlotte Germonpré^a, Robrecht Raedt^a, Joren Vanbraband^a, Paul Boon^a, Veerle De Herdt^a

(a) *Laboratory for Clinical and Experimental Neurophysiology, Neurobiology and Neuropsychology (LCEN3), Ghent University, Belgium*

PURPOSE Intracerebral hemorrhage (ICH) is a known risk factor for the development of seizures, but little is known about the incidence and consequence of seizures in the acute phase post-ICH. In this study, ICH was induced by injecting different doses of collagenase in dorsal striatum and the occurrence of seizures in each condition was assessed.

METHODS Fifteen male Sprague-Dawley rats were implanted with scalp electrodes (4AP +/-2ML and -4.5AP +/-3ML, coordinates in mm and relative to bregma) and injection-site was marked. After minimum one week of baseline video-EEG recording, rats were injected with collagenase (0.2U (n=2), 0.4U (n=3), 0.6U (n=3), 0.8U (n=4) and 1U (n=3), 0.5AP 3.5ML 6DV) and immediately reconnected to the video-EEG setup during 7 days. Afterwards animals were euthanized to visualize the hemorrhage by histology and video-EEG recordings were analyzed.

RESULTS ICH was present in all animals. Epileptic seizures occurred in 4/15 animals: 1/3 rats injected with 0.6U (n=25, 47h-96h after ICH induction), 1/4 rats injected with 0.8U (n=12, 4h-25h after ICH induction) and 2/3 rats injected with 1U (n=4, 12h-53h/8h-61h after ICH induction). Two animals died during post-ICH recordings (1/4 rats injected with 0.8U and 1/3 rats injected with 1U).

CONCLUSION Injecting rats with 0.6U of collagenase seems to be the most promising condition to study post-stroke seizures in the rat collagenase model as it resulted in hemorrhagic stroke in all animals without causing mortality and with an incidence rate of stroke-induced seizures of 30%. However this needs to be confirmed in a larger study population.